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## Discovery



Remains of *Patagotitan mayorum*, a part of a lower thighbone, were initially discovered in 2008 by a farm laborer, Aurelio Hernández, in the desert near La Flecha, about 250 km (160 mi) west of Trelew. Excavation was done by palaeontologists from the Museum of Paleontology Egidio Feruglio. The lead scientists on the excavation were Jose Luis Carballido and Diego Pol, with partial funding from The Jurassic Foundation. Between January

<div><div></div><div><h1>Patagotitan</h1><div>Temporal range: Albian</div><div><div></div><div>101.62 Ma</div><div></div></div></div></div>										
PreЄ	Є	O	S	D	C	P	T	J	K	PgN
<div><div><div><span></span><div><div><span><span></span></span></div><div><div>Reconstructed skeleton on display at the Field Museum of Natural History, Chicago, IL</div></div></div></div></div></div>										
Scientific classification									<span></span>	
Kingdom:	Animalia									
Phylum:	Chordata									
Clade:	Dinosauria									
Clade:	Saurischia									
Suborder:	†Sauropodomorpha									
Clade:	†Sauropoda									
Clade:	†Titanosauria									
Clade:	†Lithostrotia									
Clade:	†Lognkosauria									
Genus:	† <i>Patagotitan</i> <div>Carballido et al., 2017</div>									
Type species										
† <i><b>Patagotitan mayorum</b></i> <div>Carballido et al., 2017</div>										

The type species *Patagotitan mayorum* was named and described by José Luis Carballido, Diego Pol, Alejandro Otero, Ignacio Alejandro Cerda, Leonardo Salgado, Alberto Carlos Garrido, Jahandar Ramezani, Néstor Ruben Cúneo and Javier Marcelo Krause in 2017. The generic name combines a reference to Patagonia with a Greek Titan for the "strength and large size" of this titanosaur. The specific name honours the Mayo family, owners of La Flecha ranch.<sup>[2]</sup>

The holotype, **MPEF-PV 3400**, was found in a layer of the Cerro Barcino Formation, dating from the latest Albian. The particular stratum has an age of 101.62 plus or minus 0.18 million years ago. The holotype consists of a partial skeleton lacking the skull. It contains three neck vertebrae, six back vertebrae, six front tail vertebrae, three chevrons, ribs, both breast bones, the right scapulocoracoid of the shoulder girdle, both pubic bones and both thighbones. The skeleton was chosen to be the holotype because it was the best preserved and also the one showing the most distinguishing traits. Other specimens were designated as the paratypes. Specimen MPEF-PV 3399 is a second skeleton including six neck vertebrae, four back vertebrae, one front tail vertebra, sixteen rear tail vertebrae, ribs, chevrons, the left lower arm, both ischia, the left pubic bone and the left thighbone. Specimen MPEF-PV 3372 is a tooth. Specimen MPEF-PV 3393 is a rear tail vertebra. Specimen MPEF-PV 3395 is a left humerus as is specimen MPEF-PV 3396, while specimen MPEF-PV 3397 is a right humerus. Specimen MPEF-PV 3375 is a left thighbone while MPEF-PV 3394 is a right one. Specimens MPEF-PV 3391 and MPEF-PV3392 represent two calfbones.<sup>[2]</sup>

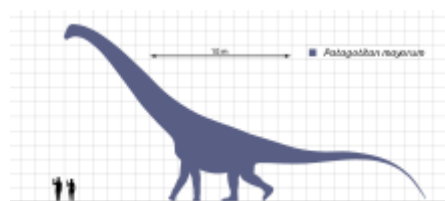


Vertebra

The animals found, though excavated in one quarry, did not all die at the same time. Within the 343 centimetre thick sediment containing the fossils, three distinct but closely spaced horizons correspond to three burial events in which young adults perished due to floods. The water did not transport the carcasses any further but covered them with sandstone and mudstone.<sup>[2]</sup> The animals were about the same size, differing no more than 5% in length. As far as can be ascertained, all bones discovered belong to the same species and are thus part of a monospecific assemblage.<sup>[2]</sup>

## Description and size

Like other titanosaur sauropods, *Patagotitan* was a quadrupedal herbivore with a long neck and tail and is notable for its large size. In 2014 news reports stated size estimates of 40 m (131 ft) long with a weight of 77 tonnes (85 tons);<sup>[3][1]</sup> science writer Riley Black had cautioned in 2014 that it was still too early to make size estimates with the desirable scientific certainty.<sup>[4]</sup> In 2017 the species description of *Patagotitan mayorum* was published which estimated a length of 37 m (121 ft) long, with an approximate weight of 69 tonnes (76 tons) when using a scaling equation, and 44.2–77.6 tonnes (43.5–76.4 long tons; 48.7–85.5 short tons) when using volumetric method based on 3D skeletal models.<sup>[1][2]</sup> In 2019 Gregory S. Paul listed *Patagotitan* at 31 m (102 ft) in length and 50–55 tonnes (49–54 long tons; 55–61 short tons) in weight using volumetric models, making it smaller than Argentinosaurus which was estimated at 35 m (115 ft) or more in length and 65–75 tonnes (64–74 long tons; 72–83 short tons) in weight.<sup>[5]</sup>



*P. mayorum* compared to a human.

*Patagotitan*'s humerus was 1.675 m (5.50 ft) long, smaller from that of other giants such as Notocolossus (1.76 meters) and Paralititan (1.69 meters). Its femur measured 2.38 m (7.8 ft) in length making it the longest known, although Paul estimated the total size of the isolated femur (MLP-DP 46-VIII-21-3 specimen), which is referred to Argentinosaurus, at 2.575 m (8.45 ft) making it larger than *Patagotitan*'s. He also noticed that the articulated dorsal series length was larger in Argentinosaurus (4.47 meters) than in *Patagotitan* (3.67 meters).<sup>[5]</sup>

The researchers who described *Patagotitan* stated in the media:<sup>[6]</sup>

Given the size of these bones, which surpass any of the previously known giant animals, the new dinosaur is the largest animal known that walked on Earth.

Following the publication of *Patagotitan*, Riley Black and paleontologist Matt Wedel further cautioned against the media hype. In blog posts, Wedel noted that based on available measurements *Patagotitan* was comparable in size to other known giant titanosaurs, however, almost every bone measurement that could be compared are larger in *Argentinosaurus*. Wedel also criticised the researchers mass estimation technique. <sup>[7][8][9]</sup> In other studies *Argentinosaurus* has been estimated at 65–96.4 tonnes (71.7–106.3 tons).<sup>[10][11][12][5]</sup>

## Distinguishing traits

The authors indicated nine distinguishing traits of *Patagotitan*. The first three back vertebra have a *lamina prezygodiapophysealis*, a ridge running between the front articular process and the side process, that is vertical because the front articular process is situated considerably higher than the side process. With the first two back vertebrae, the ridge running to below from the side front of the neural spine has a bulge at the underside. Secondary articulating processes of the hyposphene-hypantrum complex type are limited to the articulation between the third and fourth back vertebra. The middle and rear back vertebrae have vertical neural spines. In the first tail vertebra, the centrum or main vertebral body has a flat articulation facet in front and a convex facet at the rear. The front tail vertebrae have neural spines of which the transverse width is four to six times larger than their length measured from the front to the rear. The front tail vertebrae have neural spines that show some bifurcation. The upper arm bone has a distinct bulge on the rear outer side. The lower thighbone has a straight edge on the outer side.<sup>[2]</sup>

## Classification

In 2017, *Patagotitan* was placed, within the Titanosauria, in the Eutitanosauria and more precisely the Lognkosauria, as a sister species of *Argentinosaurus*. Several subclades of the Titanosauria would have independently acquired a large body mass. One such event would have taken place at the base of the *Notocolossus* + Lognkosauria clade leading to a tripling of weight from maximal twenty to maximal sixty tonnes.<sup>[2]</sup>



Front limb and shoulder blade at Museo Egidio Feruglio de Trelew, Chubut

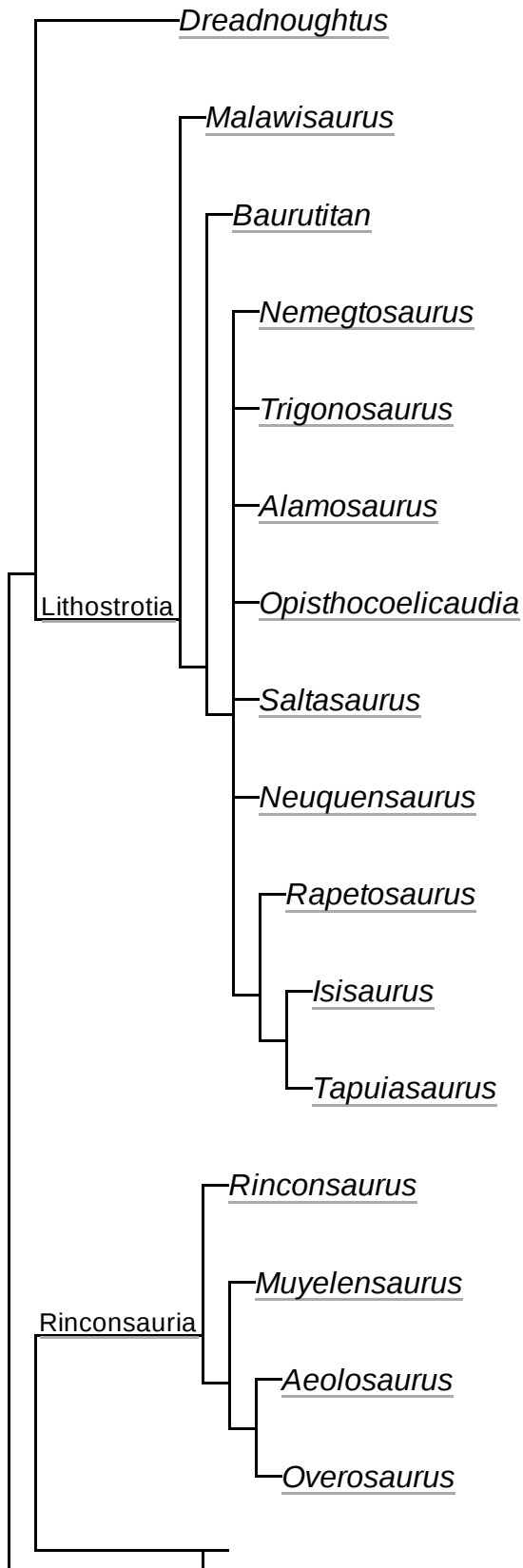


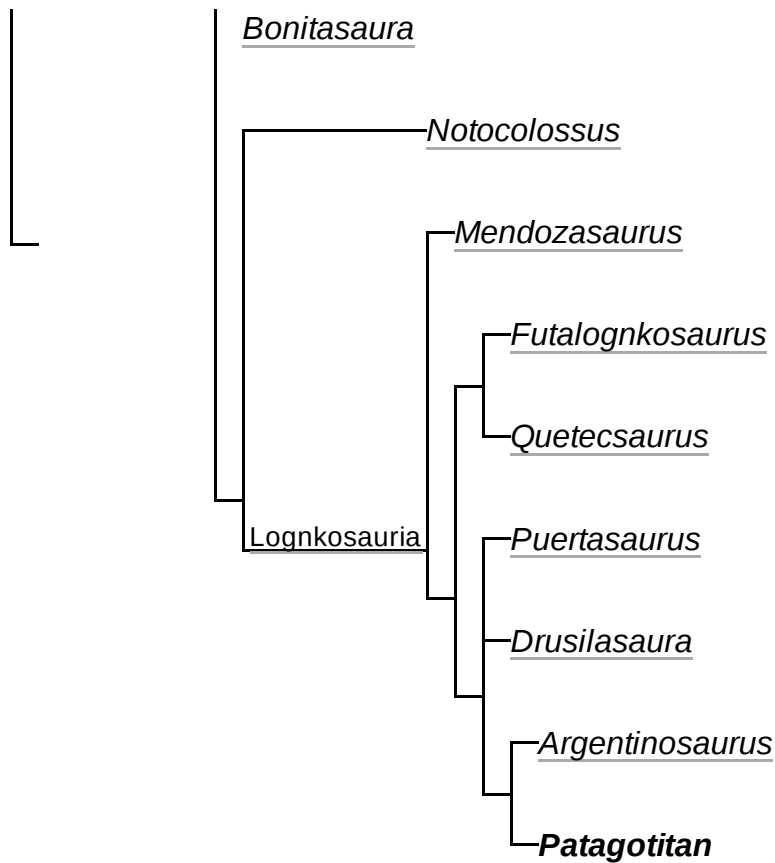
Chevrons and other bones



Reconstructed skeleton on display at the American Museum of Natural History, New York

Eutitanosauria





## Paleoecology

*Patagotitan* lived during the Late Cretaceous period, between 102 and 95 million years ago, in what was then a forested region.<sup>[3][13][14]</sup> The bearing sediments indicate that sedimentation took place with a low energy setting, related to floodplains of a meandering system (Carmona et al., 2016).<sup>[2]</sup>

## See also

- Largest dinosaurs



Life restoration of two *Patagotitan* at dawn

## Further reading

- Meet Patagotitan, the Biggest Dinosaur Ever Found (<https://www.theatlantic.com/science/archive/2017/08/is-this-really-the-biggest-dinosaur-ever-discovered/536187/>) by Ed Yong, 2017

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## External links

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- [David Attenborough and the Giant Dinosaur, BBC](http://www.bbc.co.uk/programmes/p03dwy5z) (<http://www.bbc.co.uk/programmes/p03dwy5z>)
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Retrieved from "<https://en.wikipedia.org/w/index.php?title=Patagotitan&oldid=968938880>"

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